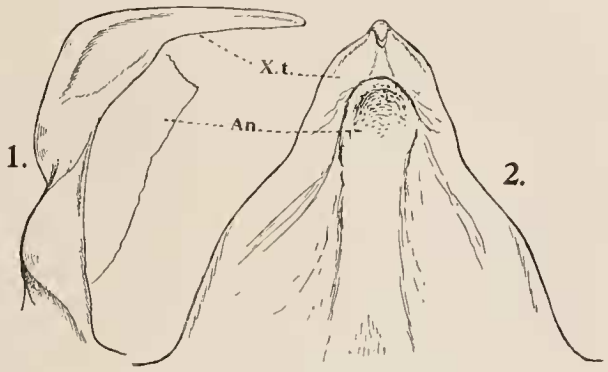
# ON *CYPA DECOLOR* AND SOME ALLIED SPECIES (LEPID., SPHINGIDAE).

By DR. KARL JORDAN.

(With 24 text-figures.)

MAJOR F. B. SCOTT has bred at Shillong, Assam, a series of specimens of a species of *Cypa* which agrees so well in external appearance with *C. decolor* Walk. that it was at first taken to be this species. An examination of the structure of the Assamese insect, however, revealed astonishingly great differences from *C. decolor*. This discovery made it necessary to compare the forms of *Cypa* from other places than Northern India. Unfortunately, only one female each is known from the North-Western Himalayas and Ceylon, and the species has not yet been discovered in Southern India. The following report, therefore, is incomplete and will have to be supplemented and perhaps corrected when adequate material has come to hand from the districts referred to.




Figs. 1 and 2.—*Cypa decolor decolor.*

1. **Cypa decolor** Walk. 1856 (text-figs. 1, 2, 7, 10, 11, 16, 17).

♂♀. Palpus about as long as the distance from its apex to the base of the antenna, segment II and III being about twice as long as broad (inclusive of scaling).

Upperside of forewing: in outer half between the dark shadowy bands a clayish or ochraceous-clay tint, particularly in ♂.——On underside of forewing this pale tint often conspicuous in ♂, almost forming two blotches between $R^1$ and $M^1$; termen shaded with blackish brown; terminal area as a whole usually not strongly contrasting with proximal two-thirds of wing, particularly in ♀.

♂. Anal tergite (X. t.) not divided, ending with a simple, long, narrow, subcylindrical process which is curved downward (text-figs. 1 and 2). the narrow portion being almost straight in lateral aspect (text-fig. 1). No anal sternite. Clasper (text-fig. 7) ventrally with two rather strongly swollen tubercles, a sort of condyli (us and ls); from dorsal margin [1] a long subbasal process (ap) projects into the cavity of the clasper, the process being slender, slightly claviform and a little curved, bearing at apex a variable number of teeth; this process arises from a dorsal arch (ar) which distally divides into an anterior low ridge (mr) and

[1] In Revision of Sphingidae (1903), p. 298, tab. 33, fig. 7, the clasper is inverted, the dorsal side of the figure being in reality the ventral side.

a posterior flat process, which widens dorsad and gradually narrows ventrally into a long sharp beak, that sometimes reaches to the ventral margin of the clasper; this process (dp) absent in the allied known species. Penis-sheath (text. figs. 10 and 11) close to apex with a long, transversely directed, smooth process which gradually narrows to a sharp point; no armature on the other side.

♀. In front of the sexual orifice (va, text-fig. 16) a low ridge which is somewhat wrinkled; behind the orifice a large smooth plate (VIII. st.), which has a smooth distal margin, bears an indication of an impressed median longitudinal line and has proximally a slight tubercle at each side of middle line. VIII. t. peculiar (text-fig. 17): medianly divided, a subtriangular cavity being formed which narrows proximally and is large in Indian and Philippine specimens and small in Papuan ones; margin of segment, on apical side of cavity, strongly folded or smooth, the folding being probably due to shrinkage. The contrast between this tergite and the simple one of *C. pallens* (text-fig. 19) is very remarkable.

*Hab.* India to New Guinea.

In the Revision of Sphingidae we treated *C. ferruginea* Walk. 1856 as a subspecies of *C. decolor*; but the shape of the forewing suggests that it is a distinct species (cf. below, spec. No. 2).

The subspecies of *C. decolor* are not sharply defined, the Malayan specimens being intermediate between the Indian and Papuan forms.

### (*a*) C. decolor decolor Walk. 1856.

♂♀. *Smerinthus decolor* Walker, *List Lep. Ins. B.M.* viii, p. 255, no. 19 (1856) (Hindostan.——♂♀ in Mus. Oxon.).

♂. *Cypa incongruens* Butler, *Illustr. Typ. Specim. Lep. Het. B.M.* v, p. 12, tab. 80, figs. 8, 9 (1881) (Darjiling).

The types of *C. decolor* and *C. incongruens* have been compared; the ♂♂ have the simple anal tergite as above described (text-figs. 1 and 2).

*Hab.* India: Sikkim. I have no specimens from any other district, and I have no means of ascertaining as to whether the specimens recorded from Tavoy and Ponsekai (cf. Revision of Sphingidae) belong to *C. decolor* or some other species.

### (*b*) C. decolor manilae Clark 1930.

♂♀. *Cypa decolor manilae* Clark, *Proc. New Engl. Zool. Club*, xii, p. 28 (1930) (Philippines; Sumatra).

The series of specimens collected by Wileman on Luzon exhibits such individual variability that the distinctions of *C. d. manilae* from *C. d. decolor* are almost effaced. The ♂, on the whole, paler than in *C. d. decolor*, the bands on the upperside of the forewing rather more pronounced, the broad postmedian one narrower. ♀ as in *C. d. decolor*.

*Hab.* Philippine Is., Sumatra, Singapore and Federated Malay States; probably also on Borneo.

### (*c*) C. d. euroa R. & J. 1903.

♀. *Cypa decolor euroa* Rothschild and Jord., *Revision of Sphingidae*, p. 299, tab. 17, fig. 11 (genit.) (1903) (Milne Bay).

♂♀. The palest subspecies of *C. decolor*; wings and body above and below (upperside of hindwing excepted) of a buff tint; upperside of forewing with six

darkish bands or lines more or less clearly marked, three in proximal half and three in distal half. In ♂ anal tergite somewhat shorter than in the two previous subspecies. In ♀ the postvaginal plate (VIII. st.) and the dorsal plate (VIII. t.) much shorter than in the other species, the former also broader and less rounded; the apical impression on VIII. t. small and shallow, variable in size.

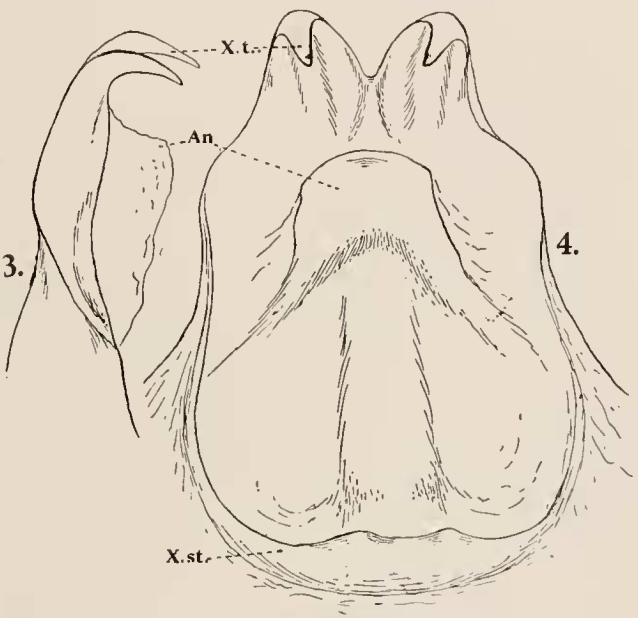
*Hab.* Duteh, Mandated and British New Guinea, inelusive of Goodenough and Sudest; in Mus. Brit. also from Ceram (Miss Longfield).

### 2. **Cypa ferruginea** Walk. 1856.

♀. *Cypa ferruginea* Walker, *List Lep. Ins. B.M.* xxxi, p. 42 (1864) (Ceylon.——Genotype of *Cypa*).
♂♀. *Cypa ferruginea*, Moore, *Lep. Ceyl.* ii, p. 8, tab. 79, fig. 3 (1882).

The ♂ not known to me; one ♀ in Mus. Brit. In this specimen the distal margin of forewing somewhat convex in centre, but otherwise with hardly a trace of dentition. Palpus small as in *C. pallens*. Antenna more distinctly incrassate behind middle, slightly constricted at the joints, the segments being somewhat rounded in a ventral aspect.—— The status of this Hawkmoth remains as yet doubtful.

*Hab.* Ceylon.




3. 4.

Figs. 3 and 4. *Cypa uniformis.*

### 3. **Cypa uniformis** Mell 1922 (text-figs. 3, 4, 8, 12, 13).

♂♀. *Cypa decolor uniformis* Mell, *Biol. u. Syst. Südchin. Sphing.* p. 168, tab. 35, fig. 14a, b (genit.) (1922) (S. China).

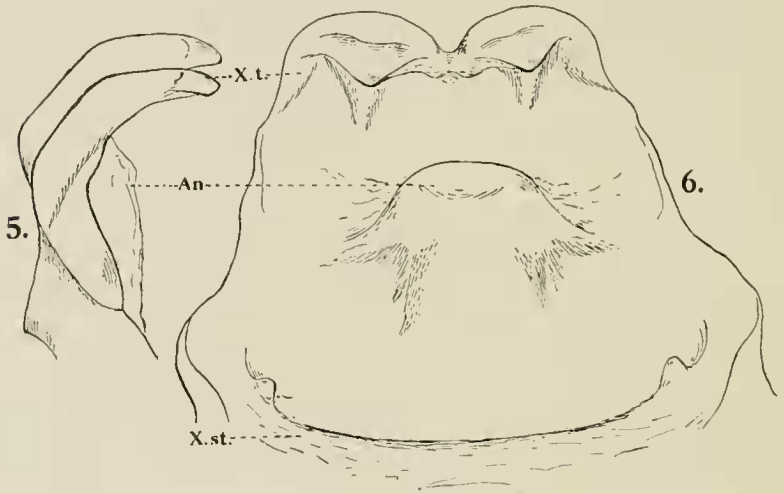
♂♀. Palpus shorter than in *C. decolor*, its distance from base of antenna much longer than the palpus, the second (plus third) segment being about as long as broad, closely appressed to the head.

Upperside of forewing more uniform in colour than in *C. decolor*.—— On underside the terminal area of forewing and the whole hindwing paler, and the tawny smear on abdominal area of hindwing more prominent. Genitalia widely different.

♂. Anal tergite (X. t., text-figs. 3 and 4) broad, divided into two apical hooks which are curved downward and rather sharply pointed. Anal sternite (X. st., text-fig. 4) represented by a low ridge which is somewhat raised on each side of middle. Basal condyloid swellings of clasper (us and ls, text-fig. 8) less elevate than in *C. decolor*; proximal process ap of arch (ar) shorter and stouter,

with heavier teeth ; distal process dp absent, the arch disappearing in the swollen ventral surface of clasper ; above the arch a conspicuous, setiferous, longitudinal fold. Penis-sheath (text-figs. 12 and 13) likewise considerably different from that of *C. decolor* : the left-side process (text-fig. 12) much broader (somewhat foreshortened in the figure), ventrally dentate in its apical two-thirds, also placed less close to apex than in *C. decolor* ; on right side an oblique longitudinal ridge which extends to apex and is dentate on one side (text-fig. 13, in which only the apex of the process of fig. 12 is visible).

♀. In the only ♀ seen the collector has cut the abdomen open and filled it




FIGS. 5 and 6.—*Cypa pallens enodis.*

with cotton wool, accidentally injuring the genital sclerites to some extent. The armature is similar to that of the ♀ of the next species (cf. text-fig. 18).

*Hab.* South China.——Dr. B. Preston Clark has very kindly sent me for examination the type (♂) and a paratype (♀) of this species.

4. **Cypa pallens** Jord. 1926 (text-figs. 5, 6, 9, 14, 15, 18, 19).

♀. *Cypa decolor pallens* Jordan, *Nov. Zool.* xxxiii. p. 380, no. 4 (1926) (Masuri).

As the single ♀ from Masuri agrees in the genital armature fairly well with ♀♀ from Assam, we treat the Assamese specimens and the type of *C. pallens* as belonging to one species ; however, ♂♂ from the Western Himalayas may upset this conclusion.

*C. pallens* evidently represents *C. uniformis* in India ; but the differences in the ♂-genitalia are so considerable that we must consider these Hawkmoths as having attained a degree of distinctness which we call specific.

♂♀. Palpus as in *C. uniformis*, both sexes being easily differentiated from *C. decolor* by the shortness of the second segment. Colouring likewise as in *C. uniformis*, sometimes more tawny, sometimes more grey.

♂. Anal tergite (X. t.) divided as in *C. uniformis*, but broader, the two apical processes much broader and shorter and obtuse ; the ridge representing the anal sternite (X. st.) with a small tubercuiform projection on each side far away from middle, not near middle as in *C. uniformis*. Clasper (text-fig. 9)

narrower at apex than in the previous species ; above the armature a longitudinal setiferous fold as in *C. uniformis* ; proximal process ap broad, convex on proximal side, concave on distal side, somewhat rugulose in apical half, without teeth ;

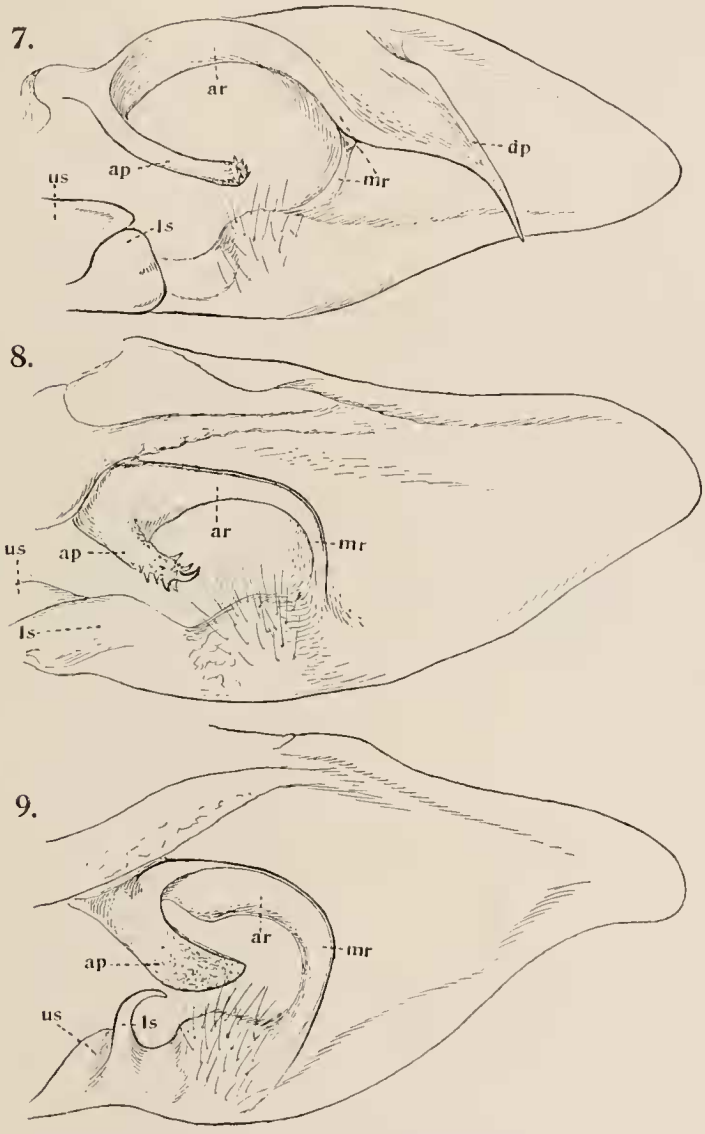
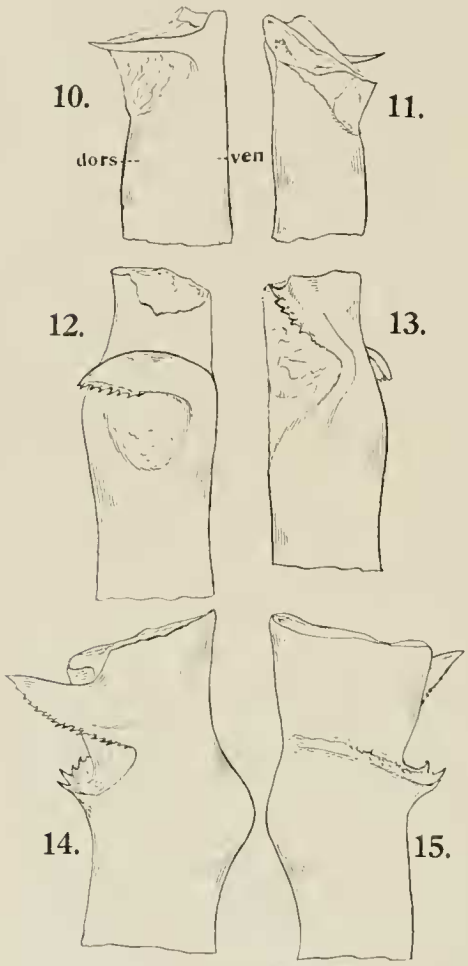



Fig. 7.—*Cypa decolor decolor.*
Fig. 8.—*Cypa uniformis.*
Fig. 9.—*Cypa pallens enodis.*

arch ar ventrally dilated near base ; process dp of *C. decolor* absent. Lower basal conduliform ls produced upwards into a prominent, sharply pointed, hook. Penis-sheath (text-figs. 14 and 15) wider than in both previous species ; on left side a triangular subapical process, sharply pointed, with the frontal margin

dentate from close to base to apex ; the process recalling that of *C. uniformis*, but more apical and different in shape and direction ; on frontal side of process the sheath concave, as it is in the other species, but in contradistinction to them there is at the proximal side of this depression a dentate, transverse ridge which extends across the right side of the sheath (text-fig. 15), probably being homologous to the longitudinal ridge of *C. uniformis*.




FIGS. 10 and 11.—*Cypa decolor decolor.*
FIGS. 12 and 13.—*Cypa uniformis.*
FIGS. 14 and 15.—*Cypa pallens enodis.*

♀. Antevaginal ridge of VII. st. (text-fig. 18) strongly wrinkled, higher than in *C. decolor*. The smooth postvaginal plate of *C. decolor* replaced by a much smaller plate which is divided by a deep median channel into two sclerites (VIII. st.), which are either smooth or more or less rugulose ; behind these sclerites the membranous portion of the segment folded, the folds more or less parallel with the oblique posterior margin of the segment. Tergite VIII (text-fig. 19) transverse, smooth, truncate with the angles rounded off, without median division and without apical cavity or impression.

*Hab.* North-Eastern to North-Western India.

### (*a*) **C. pallens enodis** subsp. nov.

♂♀. As compared with *C. decolor decolor* from Sikkim, this subspecies has the terminal area of forewing b e l o w contrasting by its greyish tint with the tawny area, and the tawny smear along abdominal fold of hindwing long and prominent. U p p e r s i d e clay colour to cinnamon, with a strong drab or fawn bloom in fresh specimens ; u p p e r s i d e of hindwing, basal two-thirds of forewing b e n e a t h (except margins) and a smear in abdominal area of hindwing b e n e a t h tawny. Length of forewing 30 mm. or less, width 12 mm. or less.

*Hab.* Assam : Shillong (type), a series bred by Major F. B. Scott ; Cachar, 1 ♀.——Sikkim, 1 ♂ (ex coll. Elwes).

### (*b*) **C. pallens pallens** Jordan 1926.

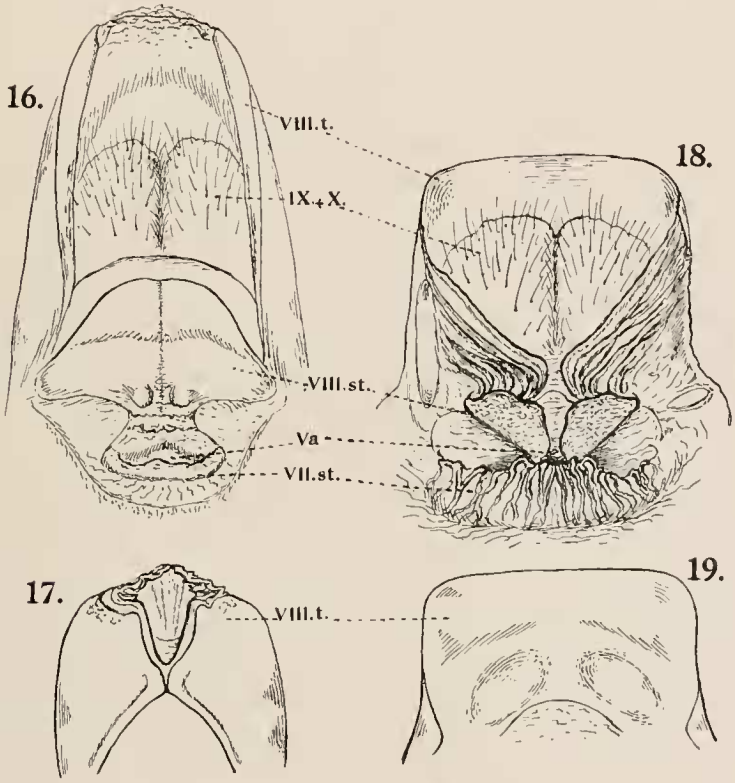
Cf. above, p. 238.

♀. Larger than any specimen of *C. p. enodis*, length of forewing 34 mm.,

width 13·5 mm., paler above and below. Antevaginal ridge and lateral, submembranous, portion of segment VIII, less wrinkled, and the two sclerites of VIII. st. larger, smooth, glossy.

*Hab.* N.W. India: Masuri, 1 ♀.

The insect described by Wileman in *Entom.* 43, p. 137 (1910) from Formosa as Cypa (?) formosana belongs to *Amorphulus* Mell (1922). It agrees closely width *A. chinensis* R. & J. (1903), but $SC^2$ and $R^1$ (= 6 and 7) of hindwing are




Figs. 16 and 17.—*Cypa decolor decolor.*
Figs. 18 and 19.—*Cypa pallens enodis.*

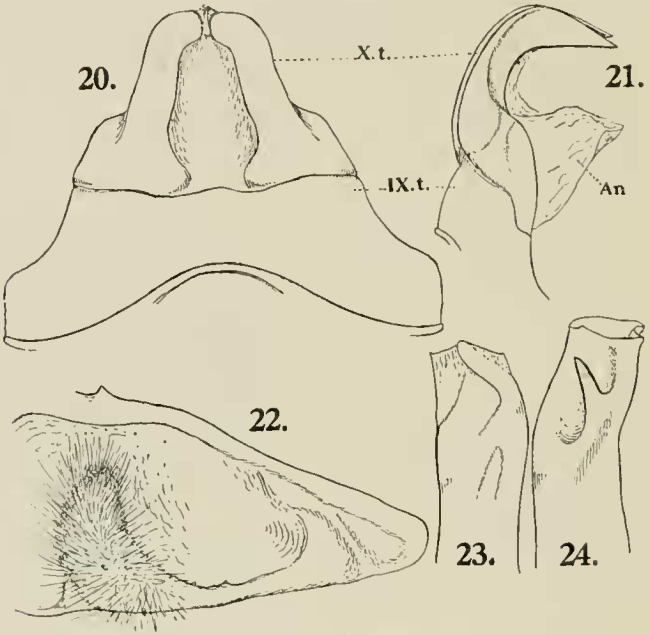
stalked, a character which is probably variable. *Amorphulus* is essentially based on differences from *Cypa* and *Smerinthulus* in the early stages.

### 5. **Smerinthulus brooksi** Clark 1930 (text-figs. 20–24).

*S. brooksi* Clark, *Proc. New England Zool. Club*, xii. p. 27 (1930) (Benkoelen, Sumatra).

By some unfortunate oversight I forgot to send to Dr. B. Preston Clark the sketches I had made of the genitalia of the type of this peculiar little Sphingid. As these organs exhibit several points of interest, I take this opportunity of publishing the drawings. Anal tergite (X. t., text-figs. 20 and 21) divided into two pointed hooks, which, in a dorsal aspect of the segment (fig. 20), are just visible as short triangular projections which almost touch each other; the division continued proximad by a broad groove down to the apical margin of

segment IX ; no X. st. Clasper (text-fig. 22) triangular, with a bristly proximal swelling which extends from ventral margin dorsad, but does not reach dorsal margin ; the posterior margin of the swelling continuous with a low longitudinal ridge which is parallel with the ventral margin of clasper and bears two small




FIGS. 20 to 24.—*Smerinthulus brooksi*.

teeth. Penis-sheath (text-figs. 23 and 24) on one side with a smooth longitudinal, oblique, swelling which is not produced into a free process, and on the other side with a subapical depression, from the lateral margin of which projects distad a narrow process which is pointed, smooth, somewhat finger-like, and does not reach apex ; this process absent from the other species of *Smerinthulus* examined (cf. Revision of Sphingidae, p. 299).